PROGRAM

1st meeting of the NeuroMod Institute, Frejus, 1-2 july 2019

1st July	
9h00 – 10h00	Registration
10h00 – 10h45	**Opening and introductions**
10h00 – 10h15	Opening remarks
10h15 – 10h45	Presentation of the NeuroMod Institute, *P. Reynaud-Bouret*
10h45 – 12h00	**Plenary session –** Moderator: *M. Clerc*
10h45 – 11h20	**Keynote lecture**: Action selection and learning: from principles to brain functions, *E. Daucé*
11h20 – 11h40	Reinforcement learning is called behaviourism in the Humanities. *T. Scheer*
11h40 – 12h00	Assessment of apathy and beyond: an example of the FRIS activities. *P. Robert*
12h00 – 13h30	Lunch
13h30 – 15h30	**Modeling of physiological and pathological states in neuroscience: exchanges among theoreticians and experimentalists* - Session 1 -** Moderators: *B. Cessac, M. Mantegazza*
13h30 – 13h50	Neural codes for odors and emotions: unraveling olfaction by high-performance computing and machine learning. *Cong X.*
13h50 – 14h10	Probing retinal function with a multi-layered simulator. *Kartsaki E.*
14h10 – 14h30	Convolutional autoencoder for waveform learning. *Sedlar S.*
14h30 – 14h50	Hippocampal rhythmic activity modifications associated to epileptogenesis and ictogenesis in Scn1aR1648/+ mice. *Capitano F.*
14h50 – 15h30	Group discussion introduced by presentations of *B. Cessac & M. Mantegazza*
15h30 – 16h30	Coffee break and **Poster session: Modeling of physiological and pathological states in neuroscience: exchanges among theoreticians and experimentalists**
	Modelisation of physiological states occurring during rapid relaxation. *A. Guyon*

	Monotonic Gaussian Process for Spatio-Temporal Trajectory Separation in Brain Imaging Data. *C. Abi-Nader*
	Modeling the initiation of cortical spreading depression triggered by the hyperactivity of GABAergic neurons. *L. Lemaire*
	Sparse Multi-Channel Variational Autoencoder. *L. Antelmi*
	Large Scale Cardiovascular Model Personalisation for Mechanistic Analysis of Heart & Brain Interactions *J. Banus*
	Simulating the cortical activity evoked by artificial retinal implants *T. Andréoletti*
	Asynchronous High Performance Computing (AHPC) of large-scale networks of point process neurons *P. Mascart*
	Mean-field model for short-term synaptic plasticity. *H. Taher*
	Simulation of Hawkes processes *T.C. Phi*
16h30 – 17h50	**Modeling of physiological and pathological states in neuroscience: exchanges among theoreticians and experimentalists - Session 2 -** Moderator: *M. Lorenzi*
16h30 – 16h50	Functional connectivity and reconstruction from spike trains. *I. Bethus*
16h50 – 17h10	Towards a stochastic model of excitatory synapse. *Y. Elias Rodriguez*
17h10 – 17h30	A sub-Riemannian cortical model with frequency-phase and its application to orientation map construction. *E. Baspinar*
17h30 – 17h50	Modeling and inference of spatio-temporal protein dynamics across brain networks. *S. Garbarino*
17h50 – 18h00	Break
18h00 – 19h15	**Modeling of physiological and pathological states in neuroscience: exchanges among theoreticians and experimentalists - Session 3: Vision** – Moderator *B. Cessac*
18h00 – 18h20	Anticipation in the retina and the primary visual cortex: towards an integrated retino-cortical model for motion processing. *S. Souihel*
18h20 – 18h40	Model quantification of direction selectivity in starbust amacrine cells in the mammalian retina. *L. Medina*
18h40 – 19h00	Specialized visual sensor coupled to a dynamic neural field for embedded attentional process *L. Rodriguez*
19h00 – 19h15	Discussion
20h00	Evening Reception

2nd July	
7h30 – 9h00	Breakfast
9h00 – 10h45	****EEG-based evidence for cognitive processes** – Moderator: *T. Scheer*
9h00 – 9h20	Measuring auditory attention with EEG. *J. Benerradi*
9h20 – 9h40	Rel@x project: sensorial immersion and EEG. *A. Gros*
9h40 – 10h00	A new scheme using signal processing tools to evoke and analyze ERP in giftedness: A cross-disciplinary approach. *Guetat S.*
10h00 – 10h20	Connectivity-informed solution for spatio-temporal M/EEG source reconstruction. *Kojcic I.*
10h20 – 10h40	Syntactic processing is resilient to aging: pilot data on pronoun comprehension in French. *S. Arslan*
10h40 – 11h00	Discussion
11h00 – 11h15	Coffee Break
11h15 – 12h30	**Brain-computer interfaces & ICT** – Moderator V. Manera
11h15 – 11h35	Design of a subject-dependent cVEP brain-computer interface. *F. Turi*
11h35 – 11h55	Telemedicine tool for cognitive disorders screening, diagnostic and follow-up. *R. Guerchouche*
11h55 – 12h15	The use of nTIC for a multimodal and multidimensional assessment of apathy. *R. Zeghari*
12h15 – 12h30	Discussion
12h30 – 14h00	Lunch
14h00 – 15h00	**Poster session: EEG-based evidence for cognitive processes, learning and clinical markers**
	Automatic detection of epileptic seizures by video-EEG. *M. Sano*
	Modeling of Goal-oriented Human Motion Evolution using Hidden Markov Models. *E. Ahmed*
	Theta activity and phase resetting during perception of French homophonous utterances. *N. Do Carmo Blanco*
	Activity-based Credit Assignment (ACA) for Cognitive Task Learning. *Sabri O.*
	Exploring the prevalence of cognitive apathy in the general population. *V. Manera*
	Graphic markers of Progressive Primary Aphasia. *A. Gros*
15h00 – 16h00	**Projects funded by Neuromod –** Moderators: P. Bouret, M. Clerc
16h00 – 16h30	Conclusions and closing. *P. Bouret, M. Clerc*

*** Modeling of physiological and pathological states in neuroscience: exchanges among theoreticians and experimentalists**

In a virtuous cycle, modeling can use data obtained by experiments to capture essential features and organizing principles of biological systems at multiple scales, and provide hypotheses that can be directly tested with experiments. This can allow to gain important information on both physiological functions and pathological dysfunctions. However, the virtuous cycle is not always ignited and sometimes experimentalists are skeptical of modeling data, feeling that they are too far away from real biology to be informative. There is a delicate trade off between the theoreticians' quest of organizing mechanisms and principles obtained by simplifying reality, and the experimentalists will of staying as close as possible from the system under study. We will discuss what experimentalists expect from theoreticians and vice-versa, what are some new contemporary challenges in neuroscience, and how modeling could contribute to address them.

**** EEG-based evidence for cognitive processes**

The idea of this session is to share interests of colleagues who use EEG-based evidence, i.e. measurements of brain activity, in order to better understand how the mind works both in healthy populations and those who have brain-related pathological conditions. Typically research questions stem from the inquiry of the mind (or behaviour) and correlates of relevant cognitive activity are sought in the brain. Fields engaged in this type of research include psychology, neuroscience, language and health.